Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently amended) A method of generating authentication data for authenticating a physical object; the method ~~including~~comprising acts of:

measuring a property set Y of the object using a measurement procedure;

creating a property set I from the measured property set Y that meet a predetermined robustness criterion;

creating a property set A from the property set I that includes less information on the actual properties than property set Y, wherein the creating acts are guided by a criteria W;

generating a control value V in dependence on properties of the property set A; and

inserting the control value V and the criteria W in the authentication data.

2.   (Currently amended) ~~A~~ The method as claimed in claim 1,

wherein the ~~step~~ act of creating the property set A includes performing a contracting transformation that transforms given ranges of input properties to corresponding output values.

3.   (Currently amended) ~~A~~ The method as claimed in claim 2, wherein the contracting transformation transforms a property to a binary number representative of ~~a sign of~~whether the property has a positive or negative value.

4.   (Currently amended)   ~~A~~ The method as claimed in claim 1, wherein the ~~step~~ act of creating the property set A includes an act of selecting a subset of the property set I.

5.   (Currently amended) ~~A~~ The method as claimed in claim 4, including an act of creating ~~helper data~~the criteria W for controlling the selection of the subset ~~and inserting the helper data W in the authentication data~~.

6.   (Currently amended) ~~A~~ The method as claimed in claim 5, including an act of creating unique ~~helper data~~criteria W ~~for~~based on respective authentication applications, wherein different

respective authentication applications have different unique criteria.

7. (Currently amended) ~~A~~ The method as described in claim 1, wherein the predetermined robustness criterion is based on a signal to noise ratio of the measured properties and the ~~step~~ act of creating the property set I includes an act of performing a transformation on the property set Y to create two disjunct property sets I_1 and I_2 where a signal to noise ratio of properties of the property set I_1 are estimated to be higher than a signal to noise ratio of properties of the property set I_2; and wherein the ~~using~~property set I_1 is used as the property set I.

8. (Currently amended) ~~A~~ The method as claimed in claim 7, wherein the transformation is a linear transformation that converts a vector representing the property set Y to a vector with components $_i$ representing the property set I, where each vector component $_i$ is independent of the other vector components $_j$ ($j \neq i$) and wherein the vector components are sorted according to an estimated signal to noise ratio.

9. (Currently amended) A The method as claimed in claim 7, including the step act of creating the transformation in dependence on a statistical property of the measurement procedure.

10. (Currently amended) A The method as claimed in claim 9, wherein the statistical property includes a covariance matrix derived from estimated properties X of the object and a corresponding statistical distribution F determined during the measuring of the property set Y.

11. (Currently amended) A The method as claimed in claim 7, including an act of deriving a threshold from a noise level in the measured property set and assigning created properties with an absolute value larger than the threshold to set I_1.

12. (Currently amended) A The method as claimed in claim 1, wherein the step act of creating the control value V includes acts of:

converting each property of the property set A into a binary digit, and

performing a cryptographic function on properties of the

~~property set~~ A̶a combination of the binary digits.

13.   (Currently amended) A̶ The method as claimed in claim 12,
wherein the cryptographic function is a one-way function.

14.   (Currently amended) A computer program ~~product~~ stored on a
computer readable memory device for generating authentication data
for authenticating a physical object, the computer program being
operative to cause a processor to ~~perform the method of claim 1~~:

        measure a property set Y of the object using a measurement
procedure;

        create a property set I from the measured property set Y that
meet a predetermined robustness criterion;

        create a property set A from the property set I that includes
less information on the actual properties than property set Y,
wherein the creating acts are guided by a criteria W;

        generate a control value V in dependence on properties of the
property set A; and

        insert the control value V and the criteria W in the
authentication data.

15. (Currently amended) A method of authenticating a physical object; the method ~~including~~comprising acts of:

measuring a property set Y of the object using a measurement procedure;

creating a property set I from the measured property set Y that meet a predetermined robustness criterion;

creating a property set A from the property set I that includes less information on the actual properties than property set Y;

generating a control value V' in dependence on properties of the property set A,

retrieving a control value V that has been generated for the physical object during an ~~enrolment~~enrollment including a criteria W, wherein the creating acts are guided by the criteria W; and

authenticating the physical object if there is a predetermined correspondence between the ~~generating a~~ generated control value V' and the retrieved control value V.

16. (Currently amended) A computer program ~~product~~ stored on a computer readable memory device for authenticating a physical object, the computer program being operative to cause a processor

to perform the method of claim 15:

measure a property set Y of the object using a measurement procedure;

create a property set I from the measured property set Y that meet a predetermined robustness criterion;

create a property set A from the property set I that includes less information on the actual properties than property set Y;

generate a control value V' in dependence on properties of the property set A,

retrieve a control value V that has been generated for the physical object during an enrollment including a criteria W, wherein the creating the property set I and the property set A are guided by the criteria W; and

authenticate the physical object if there is a predetermined correspondence between the generating a generated control value V' and the retrieved control value V.

17. (Currently amended) A system (100) for authenticating a physical object (105); the system including an enrolment enrollment device (110), an authentication device (140), and a storage (130) for storing authentication data;

the ~~enrolment~~ enrollment device ~~(110)~~ including:

an input ~~(112)~~ for receiving a property set Y of the object measured using a measurement procedure;

a processor ~~(114)~~ for creating a property set I from the measured property set Y that meet a predetermined robustness criterion; creating a property set A from the property set I that includes less information on the actual properties than property set Y, wherein the creating the property set I and the property set A are guided by a criteria W; and generating a control value V in dependence on properties of the property set A and the criteria W; and

an output ~~(116)~~ for supplying the control value V to the storage as part of the authentication data; and

the authentication device ~~(120)~~ including:

an input ~~(142)~~ for receiving a property set ~~Y~~ Y' of the object measured using a measurement procedure and for receiving ~~a~~ the control value V from the storage including the criteria W;

a processor ~~(144)~~ for creating a property set ~~I~~ I' from the measured property set ~~Y~~ Y' that meet a predetermined robustness criterion; for creating a property set ~~A~~ A' from the property set ~~I~~ I' that includes less information on the actual properties than

property set ~~Y~~Y', wherein the creating the property set I' and the property set A' are guided by the criteria W; for generating a control value V' in dependence on properties of the property set ~~A~~A'; and for authenticating the physical object if there is a predetermined correspondence between the ~~generating a~~generated control value V' and the retrieved control value V; and

an output ~~(146)~~ for issuing a signal indicating whether or not the physical object has been authenticated.

18. (Currently amended) An authentication device ~~(140)~~ for ~~use in a system as claimed in claim 17;~~ authenticating a physical object, the authentication device ~~including~~comprising:

an input ~~(142)~~ for receiving a property set Y of a physical object measured using a measurement procedure and for receiving a control value V from a storage including a criteria W;

a processor ~~(144)~~ for creating a property set I from the measured property set Y that meet a predetermined robustness criterion; for creating a property set A from the property set I that includes less information on the actual properties than property set Y, wherein the creating the property set I and the property set A are guided by the criteria W; for generating a

control value V' in dependence on properties of the property set A;

and for authenticating the physical object if there is a

predetermined correspondence between the ~~generating a~~generated

control value V' and the retrieved control value V; and

an output ~~(146)~~ for issuing a signal indicating whether or not

the physical object has been authenticated.